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DATE: March 13, 2006

PTO IDENTIFIER: **Application Number** 10/790,502-Conf. #1038
Patent Number
Inventor: Kanu G. Shah et al.

MESSAGE TO: US Patent and Trademark Office

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Attorney Dkt. #: 60680-1843

PAGES (Including Cover Sheet): 25

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Application No. (if known): 10/790,502 Attorney Docket No.: 60680-1643

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TRANSMITTAL OF APPEAL BRIEF	Docket No. 60680-1843

In re Application of: Kanu G. Shah et al.

Application No.	Filing Date	Examiner	Group Art Unit
10/790,502-Conf. #1038	March 1, 2004	M. D. Bissett	1711

Invention: EPOXY NITRILE INSULATOR AND SEAL FOR FUEL CELL ASSEMBLIES

TO THE COMMISSIONER OF PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed: January 13, 2006 .

The fee for filing this Appeal Brief is $ 500.00 .

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Dated: March 13, 2006

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Appeal Brief Transmittal

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FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete if Known	
Application Number	10/790,502-Conf. #1038
Filing Date	March 1, 2004
First Named Inventor	Kanu G. Shah
Examiner Name	M. D. Bissett
Art Unit	1711
Attorney Docket No.	60680-1843

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fees Paid ($)**
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	**Fee ($)**	**Small Entity Fee ($)**
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	**Extra Claims**	**Fee ($)**	**Fee Paid ($)**
_____ - 20 or HP =	_____	x _____	= _____

Indep. Claims	**Extra Claims**	**Fee ($)**	**Fee Paid ($)**
_____ - 3 or HP =	_____	x _____	= _____

Multiple Dependent Claims

Fee ($)	**Fee Paid ($)**
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	**Extra Sheets**	**Number of each additional 50 or fraction thereof**	**Fee ($)**	**Fee Paid ($)**
_____ - 100 =	_____ /50	_____ (round up to a whole number) x	_____	= _____

4. OTHER FEE(S) **Fees Paid ($)**

Non-English Specification, $130 fee (no small entity discount)

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SUBMITTED BY					
Signature	Steven R. Hansen	Registration No. (Attorney/Agent)	39,214	Telephone	(248) 593-3301
Name (Print/Type)	Steven R. Hansen			Date	March 13, 2006

Fee Transmittal

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Dated: March 13, 2006 Signature: Stephanie A. Frash (Stephanie A. Frash)

Docket No.: 60680-1843
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Kanu G. Shah, et al.

Application No.: 10/790,502 Confirmation No.: 1038

Filed: March 1, 2004 Art Unit: 1711

For: EPOXY NITRILE INSULATOR AND SEAL FOR FUEL CELL ASSEMBLIES Examiner: Melanie D. Bissett

APPELLANT'S BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. § 41.37, Applicant submits this Appeal Brief in response to the Examiner's Office Action, mailed October 14, 2005. The Notice of Appeal was timely filed on January 13, 2006. As indicated in the accompanying Fee Transmittal, authorization is given to charge Deposit Account No. 18-0013 for the fees required under 37 C.F.R. § 41.20(b)(2).

This is an appeal from the decision, dated October 14, 2005 finally rejecting claims 25-38 as failing to comply with the written description requirement of 35 U.S.C. § 112, ¶ 1 and as being indefinite under 35 U.S.C. § 112, ¶ 2; finally rejecting claims 29-31 and 36-38 as being obvious under 35 U.S.C. § 103 over the combination of Pelligri, et al., U.S. Patent No. 4,197,178 ("Pelligri") and Siebert, U.S. Patent No. 4,025,578 ("Siebert"); finally rejecting claims 25, 27-28, 32 and 34-35 as being obvious under 35 U.S.C. § 103 over the combination of Pelligri and Sibert in view of the *Kirk-Othmer Encyclopedia of Chemical Technology* (Wiley & Sons 1996) ("Kirk-Othmer"); and finally rejecting claims 26 and 33 as obvious under 35 U.S.C. § 103 over the combination of Pelligri, Siebert, Kirk-Othmer, and Canfield, U.S. Patent No. 6,274,262 ("Canfield").

Each of the topics required by Rule 41.37 is presented herewith and labeled as follows:

I. Real Party in Interest
II. Related Appeals and Interferences
III. Status of Claims
IV. Status of Amendments
V. Summary of Claimed Subject Matter
VI. Grounds of Rejection to be Reviewed On Appeal
VII. Argument
VIII. Claims Appendix
IX. Evidence Appendix
X. Related Proceedings Appendix

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is DANA CORPORATION, a Corporation organized under and pursuant to the laws of Ohio having its principal place of business at 4500 Dorr Street, Toledo, Ohio 43697.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 25-38 are currently pending in the present application and stand finally rejected. The text of each of these claims is set forth in the Claims Appendix. Applicant appeals from the final rejection of claims 25-38.

IV. STATUS OF AMENDMENTS

No claim amendments were submitted following the Final Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed subject matter concerns insulators and seals for fuel cell assemblies. A typical fuel cell includes a three-layer membrane electrolyte assembly (MEA). Application at

page 2, lines 8-9. A complete fuel cell includes a pair of backing plates pressed against backing layers of the MEA. Besides providing mechanical support, the plates define fluid flow paths within the fuel cell, and collect current generated by oxidation and reduction of chemical reactants. Application at page 2, lines 25-31.

The pending claims are directed to fuel cell plates having an epoxy nitrile resin that is applied to the plate and then exposed to infrared radiation to initiate polymerization or cross-linking. The following is a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, as required by 37 C.F.R. § 41.37(c)(1)(v). The following explanation is not intended to be used to construe the claims, which are believed to speak for themselves, nor does Applicant intend the following explanation to modify or add any claim elements, or to constitute a disclaimer of any equivalents to which the claims would otherwise be entitled.

A process for sealing and insulating a fuel cell plate comprises providing a gas impermeable fuel cell plate having first and second surfaces and applying an epoxy nitrile resin at generally ambient temperatures on at least the first surface of the fuel cell plate. The coating precursor is adapted to polymerize or cross-link in response to infrared radiation. The process further comprises exposing epoxy nitrile resin on the fuel cell plate to infrared radiation to initiate polymerization or cross-linking. *See* Claim 25.

An insulated fuel cell plate comprises a gas impermeable plate having first and second surfaces and a solid coating. The solid coating is polymerized or cross-linked in response to infrared radiation at generally ambient temperatures. The coating comprises an epoxy nitrile resin and adheres to at least one of the first and second surfaces of the plate. *See* Claim 29.

A process for sealing and insulating a fuel cell plate comprises providing a gas impermeable fuel cell plate having first and second surfaces. It further comprises applying a coating consisting essentially of epoxy nitrile resin at generally ambient temperatures on at least the first surface of the fuel cell plate. The coating precursor is adapted to polymerize or cross-link in response to infrared radiation. The coating precursor is exposed to infrared radiation to initiate polymerization or cross-linking. *See* Claim 32.

An insulated fuel cell plate comprises a gas impermeable plate having first and second surfaces and a coating. The coating is polymerized or cross-linked in response to infrared

radiation and adheres to at least one of the first and second surfaces of the plate. The coating consists essentially of an epoxy nitrile resin. *See* Claim 36.

An embodiment of the fuel cell plates is depicted in Figures 1 and 2 and described at page 5, lines 9-22 of the specification (plates 106 and 108). Embodiments of the epoxy nitrile resin are described at page 6, lines 4 to 25, page 18, lines 4-30, page 19, lines 1-11, and page 24, line 18 to page 25, line 11 of the specification, as well as in Table 3 on page 29 of the specification. An embodiment of the application of the epoxy nitrile resin to at least the first surface of the fuel cell plate is described in the specification at page 5, lines 24-25, page 21, lines 1-10, and in Figures 1 and 2 (coating 132 applied to surfaces 122 and 124). Embodiments of the use of infrared radiation to initiate polymerization or cross-linking are described at page 6, lines 20-22 and 26-31, page 7, lines 1-7.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

In the Final Office Action of October 14, 2005, the following rejections were made:

(A) Claims 25-38 were rejected under the written description requirement of 35 U.S.C. § 112, ¶ 1.

(B) Claims 25-38 were rejected as indefinite under 35 U.S.C. § 112, ¶ 2.

(C) Claims 29-31 and 36-38 were rejected as obvious under 35 U.S.C. § 103 over Pelligri in view of Siebert.

(D) Claims 25, 27-28, 32, and 34-35 were rejected as obvious under 35 U.S.C. § 103 over Pelligri, in view of Siebert and in further view of Kirk-Othmer.

(E) Claims 26 and 33 were rejected as obvious under 35 U.S.C. § 103 over Pelligri in view of Siebert, in further view of Kirk-Othmer, and in further view of Canfield.

Accordingly, the following issues presented in this appeal are:

(1) Whether claims 25-38 satisfy the written description requirement of 35 U.S.C. § 112, ¶ 1;

(2) Whether claims 25-38 are definite under 35 U.S.C. § 112, ¶ 2;

(3) Whether claims 29-31 and 36-38 are obvious under 35 U.S.C. § 103 over Pelligri in view of Siebert;

(4) Whether claims 25, 27-28, 32, and 34-35 are obvious under 35 U.S.C. § 103 over Pelligri, in view of Siebert and in further view of Kirk-Othmer; and

(5) Whether claims 26 and 33 are obvious under 35 U.S.C. § 103 over Pelligri in view of Siebert, in further view of Kirk-Othmer, and in further view of Canfield.

VII. ARGUMENT

A. Claims 25-38 Satisfy the Written Description Requirement of 35 U.S.C. § 112, ¶ 1

Claims 25-38 stand rejected as failing to comply with the written description requirement of 35 U.S.C. § 112, ¶ 1. According to the Examiner, the phrase "generally ambient temperature" is not supported in the specification, rendering the claims non-compliant with the written description requirement. Office Action, dated October 14, 2005 ("10/14/05 Office Action") at 2.

"To comply with the written description requirement it is not necessary that the application describe the claimed invention in ipsis verbis . . . . all that is required is that it reasonably convey to persons of ordinary skill in the art that, as of the filing date thereof, the inventor had possession of the subject matter later claimed by him." *In re Edwards*, 568 F.2d 1349, 1351-1352 (C.C.P.A. 1978). The pending application--as filed--describes the range of radiation curing temperatures as follows: "For instance, radiation cured coating precursors can be cross-linked at much lower temperatures (e.g., ambient temperature) than heat-cured reactive coating precursors." Application at page 6, lines 29-30. This excerpt broadly references temperatures below those used in thermal curing processes. These temperatures include--as a specific example--ambient temperatures. Thus, the referenced radiation curing temperatures necessarily include those that are close to, but not exactly, "ambient." "[W]ords of approximation, such as 'generally' and 'substantially' are descriptive terms 'commonly used in patent claims to avoid a strict numerical boundary to the specified parameter.'"

Anchor Wall Systems, Inc., v. Rockwood Retaining Walls, Inc., 340 F.3d 1298, 1310 (Fed. Cir. 2003). Applicant's originally-filed specification clearly conveys the inventors' possession of curing temperatures that are "generally ambient," and not merely those that are strictly ambient.

B. Claims 25-38 Are Definite Under 35 U.S.C. § 112, ¶ 2

1. Claims 25-32

As the Examiner indicates, Applicant's claims 25-32, recite the phrase "generally ambient temperature" to describe the temperature at which the claimed epoxy nitrile resin is exposed to infrared radiation to initiate polymerization or crosslinking. According to the Examiner, "the word 'generally' renders the claim indefinite . . . ." 10/14/05 Office Action at 3. The Examiner asserts that "generally" means "usually" or "commonly," and that as a result, it is unclear whether Applicant intends to limit the temperature range or whether the temperature range is optional.

The Examiner's interpretation of "generally" is contrary to established Federal Circuit precedent. As indicated above, the Federal Circuit has expressly approved of the word "generally" as a descriptive word used "to avoid a strict numerical boundary to a specified parameter." *Anchor Wall Systems, Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 1310 (Fed. Cir. 2003). *See also North American Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 1346 (Fed. Cir. 2005) ("As NAC properly recognizes, terms of approximation such as 'generally' need not be construed with mathematical precision"). Moreover, in its response to the May 25, 2005 Office Action, Applicant clearly indicated that the claimed temperature range is not optional, arguing that the use of a "generally ambient temperature" avoids warping of the fuel cell plates. Response to Notice of Non-Compliant Amendment, dated October 4, 2005 at 6-7 ("10/4/05 Response"). Thus, the meaning of "generally ambient temperature" sufficiently delimits the scope of claims 25-32 and does not render them indefinite.

2. Claims 36-38

Contrary to the Examiner's suggestion, claims 36-38 do *not* recite the phrase "generally ambient temperatures." Thus, there is no basis for rejecting these claims as indefinite.

C. Claims 29-31 and 36-38 are Non-Obvious Over the Combination of Pelligri and Siebert

The Examiner has rejected Claims 29-31 and 36-38 as obvious under 35 U.S.C. § 103 based on the combination of Pelligri and Siebert. However, the combined references do not disclose or suggest each element of the rejected claims. Moreover, there is no motivation nor suggestion in the prior art for combining the references.

1. Claim 29

Claim 29 recites "a solid coating comprising an epoxy nitrile resin." As claimed, the coating is "polymerized or cross-linked in response to infrared radiation at generally ambient temperatures."

The Examiner contends that Pelligri discloses a gas impermeable fuel cell plate with an insulating coating comprising an epoxide resin. She concedes that Pelligri does not disclose an *epoxy nitrile* resin as positively claimed. 10/14/05 Office Action at 3. However, she contends that Siebert discloses an epoxy nitrile resin and that it would have been obvious to substitute Siebert's composition for Pelligri's composition. Specifically, the Examiner relies on Siebert's Example 1 which references a carboxyl-terminated poly(butadiene-acrylonitrile rubber) mixed with an epoxy resin and a dihydric compound, Siebert at 8:35-57. 10/14/05 Office Action at 3-4. Nevertheless, Siebert and Pelligri cannot properly be combined to render the claimed invention obvious.

a. The Prior Art Does Not Disclose or Suggest Epoxy Nitrile Fuel Cell Plate Coatings That Are Polymerized Or Crosslinked With Infrared Radiation at Generally Ambient Temperatures

The Examiner concedes that neither reference discloses or suggests the use of infrared radiation to initiate polymerization or curing at generally ambient temperatures. However, she states that "it is the Examiner's position that the cured coatings of the reference would be indistinguishable from those cured by infrared radiation." 10/14/05 Office Action at 4. Similarly, she contends that polymerization at generally ambient temperatures "would not provide a patentably distinct and structurally different product." *Id.*

First, the Examiner has failed to make a *prima facie* showing that thermally cured materials will have the same structure and properties as those cured by infrared radiation. "When the PTO seeks to rely on a chemical theory in establishing a prima facie case of obviousness, it must provide evidentiary support for the existence and meaning of that theory." *In re Grose*, 592 F.2d 1161, 1167 (C.C.P.A. 1979), citing *In re Mills*, 281 F.2d 218, 223-224 (C.C.P.A. 1960). The Examiner has cited no evidence, such as a patent, patent application, treatise, journal article or any authoritative source which suggests that coatings which are polymerized or cured via infrared radiation are structurally indistinguishable from those which are thermally cured or polymerized. *See also In re Zurko*, 258 F.3d 1379, 1385 (Fed. Cir. 2001) ("[T]he deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is 'basic knowledge' or 'common sense' to one of ordinary skill in the art").

Moreover, the Examiner cannot properly take "Official Notice" of the alleged similarity between thermally cured and radiation cured compositions. Although there are certain circumstances wherein an Examiner may take Official Notice of certain facts, those circumstances are limited to facts which "are capable of such instant and unquestionable demonstration as to defy dispute." *In re Ahlert*, 424 F.2d 1088, 1091 (C.C.P.A. 1970); *see also* Manual of Patent Examining Procedure § 2144.03 (8th ed. Rev. 4 October 2005) ("MPEP"). The impact of different curing techniques on coating structures and properties can hardly be said to fall within the category of facts which may be officially noticed. Furthermore, where Official Notice is taken, "[t]he applicant should be presented with the

explicit basis on which the examiner regards the matter as subject to official notice and be allowed to challenge the assertion . . . ." *Id.* In its October 4, 2005 response to the Office Action, dated May 25, 2005, Applicant expressly challenged the Examiner's assertion of Official Notice. 10/4/05 Response at 6. However, the Examiner has yet to state a proper basis for taking Official Notice.

b. Unlike Siebert and Pelligri, the Present Application, Recognizes the Benefits of Crosslinking or Polymerizing with Infrared Radiation at Generally Ambient Temperatures

It is undisputed that neither Siebert nor Pelligri mention the use of infrared radiation to polymerize or cross-link the disclosed materials. Conversely, Applicant's specification recognizes the structural damage that thermal curing processes cause to certain types of fuel cells:

> For instance, radiation cured coating precursors can be cross-linked at much lower temperatures (e.g., ambient temperature) than heat-cured reactive coating precursors. This is an advantage when using graphie composite fuel cell plates that can warp at temperatures associated with heat-cured coatings.

Application at page 6, line 29 to page 7, line1.

Thus, it is only the present application, and not the cited prior art, that recognizes the benefits of using infrared polymerized or crosslinked coatings. Given the structural benefits of using the claimed coatings versus those that are thermally cured, claim 29 is allowable over the combination of Siebert and Pelligri.

c. None of the Asserted References Disclose or Suggest an Epoxy Nitrile Coating Adhering to a Surface of a Fuel Cell Plate

Claim 29 also recites an epoxy nitrile solid coating "adhering to at least one of the first and second surfaces" of a fuel cell plate. Neither Pelligri nor Siebert disclose or suggest this limitation. In characterizing the reference, the Examiner states that "Siebert teaches the use of compositions comprising epoxy resin, polybutadiene-acrylontrile rubber, and an amine crosslinking agent (example 1), where the mixture is *cast* onto a substrate and thermally cured." 10/14/05 Office Action at 3. This characterization of Siebert is incorrect. Siebert's Example 1 does not disclose casting "onto a substrate." Instead, the referenced compositions were "poured into tensile sheet molds." Siebert at 9:29-30. The Examiner incorrectly

suggests that the Siebert's use of the term "cast" refers to a process of applying a composition to a surface. Siebert itself indicates that such a suggestion is incorrect:

> The mixture is casted, ***i.e., poured or injected into stationary molds,*** rotational molds and the like.

Siebert at 7:38-40 (emphasis added).

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). As indicated above, neither of the cited references disclose or suggest a fuel cell plate with an epoxy nitrile coating adhering to a surface of the plate. Nor do they suggest exposing an epoxy nitrile coating to infrared radiation to initiate polymerization or crosslinking. Thus, the combination of Siebert and Pelligri cannot render claim 29 obvious. *See also Litton Systems, Inc. v. Honeywell, Inc.*, 87 F.3d 1559, 1569 (Fed. Cir. 1996) (rejecting defendants' obviousness challenge on the grounds that "[t]he prior art simply does not contain may limitations contained in the claimed method"); *Manual of Patent Examining Procedure* (MPEP) at § 2143.03.

d. There is No Motivation or Suggestion in the Prior Art for Combining Siebert and Pelligri

Even if the combined disclosures of Pelligri and Siebert taught or suggested all of claim 29's limitations, it is improper to combine them. "When an obviousness determination is based on multiple prior art references, there must be a showing of some teaching, suggestion, or reason to combine the references." *Winner International Royalty Corp. v. Wang*, 202 F.3d 1340, 1348 (Fed. Cir. 2000) (citations omitted)). "The absence of such a suggestion [to combine references] is dispositive in an obviousness determination." *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1579 (Fed. Cir. 1997).

Here, there is no motivation or suggestion for combining Siebert and Pelligri. First, Pelligri is concerned with *coatings* for fuel cell plates. In contrast, Siebert is concerned with *moldable* products. One of ordinary skill in the art would not understand Siebert's compositions to be useful for coatings that are applied to and then polymerized or crosslinked on the surface of a fuel cell plate.

Second, nothing in Siebert suggests that its compositions would function better than Pelligri's compositions in fuel cell coating applications. The Examiner asserts that "the epoxy compositions of Siebert's invention are castable and more easily applied." However, there is no support for this assertion. Nothing in Siebert suggests that a castable (i.e., moldable) composition is easily applied as a coating. Moreover, nothing in Siebert suggests that its compositions would be "more easily applied" to the surface of a fuel cell than would Pelligri's compositions.

"The factual inquiry whether to combine references . . . must be based on objective evidence of record." *In re Sang-Su Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002). The Examiner's assertion that Siebert's compositions would be "more easily applied" than Pelligri's compositions is unsupported by any evidence of record. Furthermore, there is no basis for allowing such an assertion to be established via Official Notice, as it is not "capable of such instant and unquestionable demonstration as to defy dispute." *In re Ahlert*, 424 F.2d 1088, 1091 (C.C.P.A. 1970); *see also* MPEP § 2144.03.

2. Claims 30 and 31

Claims 30 and 31 depend from claim 29 and respectively recite that the solid coating is "less than about 250μ thick" and "less than about 150μ thick." The Examiner asserts that "it would have been prima facie obvious to apply the coating at any thickness to balance cost and insulation properties of the cell structure." 10/14/05 Office Action. However, the Examiner provides no evidence indicating that the prior art recognized the adjustment of coating thicknesses as a means to balance cost and insulation properties. Thus, she has not established a *prima facie* case of obviousness.

The Examiner does not dispute that neither Siebert nor Pelligri discloses a coating thickness of less than about 150μ thick, as recited in claim 31. However, she contends that Pelligri discloses a coating thickness of less than about 250μ thick. Nevertheless, the claimed invention uses infrared radiation to crosslink or polymerize an epoxy nitrile resin coating. One of ordinary skill in the art would not have understood that Pelligri's coating thicknesses would be suitable for a different composition and for a non-thermal polymerization or crosslinking process. Thus, the additional limitations of claims 30 and 31 further distinguish them from the prior art.

3. Claim 36

Claim 36 recites a fuel cell comprising "a coating polymerized or cross-linked in response to infrared radiation." For the reasons expressed above with respect to claim 29, the prior art does not disclose or suggest a fuel cell plate meeting this limitation. Moreover, claim 36 further recites "the coating *consisting essentially of* an epoxy nitrile resin." "By using the term 'consisting essentially of,' the drafter signals that the invention necessarily includes the listed ingredients and is open to unlisted ingredients that do not affect the basic and novel properties of the invention." *PPG Industries v. Guardian Industries Corp.*, 156 F.3d 1351, 1354 (Fed. Cir. 1998).

The Examiner suggests--without any evidence--that Siebert's and Pelligri's compositions may not affect the basic and novel properties of the invention. 10/14/05 Office Action at 4. However, Pelligri adds "aromatic amine hardeners" to its epoxy resins. Pelligri at 4:47-62. Siebert uses dihydric alcohols and also adds amines as chain extenders and crosslinkers. Siebert at 5:41-45. Thus, these additional components will affect the nature and degree of crosslinking, which will also affect the sealing and insulating properties of the material. Accordingly, neither Siebert nor Pelligri disclose or suggest a composition which "consists essentially of" an epoxy nitrile resin. "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." *See also Litton Systems, Inc. v. Honeywell, Inc.*, 87 F.3d 1559, 1569 (Fed. Cir. 1996) (rejecting defendants' obviousness challenge on the grounds that "[t]he prior art simply does not contain may limitations contained in the claimed method"); *Manual of Patent Examining Procedure* (MPEP) at § 2143.03. As a result, Pelligri and Siebert cannot render claim 36 obvious.

4. Claims 37 and 38

Claims 37 and 38 depend from claim 36 and respectively recite that the coating is less than about 250 μ thick and about 150 μ thick. As discussed above, neither Pelligri nor Siebert suggest the use of these thicknesses in an infrared polymerized or cured coating. Moreover, the Examiner has not provided any evidence establishing that the choice of thickness is obvious based on an optimization of insulation and cost.

D. **Claims 25, 27-28, 32, and 34-35 Not Obvious Over Pelligri In View of Siebert In Further View of Kirk-Othmer**

The Examiner has rejected Claims 25, 27-28, 32, and 34-35 as obvious under 35 U.S.C. § 103(a) over the combination of Pelligri, Siebert, and Kirk-Othmer. As explained above, there is no motivation or suggestion in the prior art for combining Pelligri and Siebert. Even if there were, however, there is no motivation for combining Kirk-Othmer with Pelligri and Siebert.

2. Claim 25

Claim 25 recites applying an epoxy nitrile resin to a surface of a fuel cell plate at generally ambient temperatures and exposing the resin to infrared radiation to initiate polymerization or crosslinking. It is undisputed that none of the references of record discloses or suggests applying an epoxy nitrile resin to a surface of a fuel cell. It is also undisputed that none of the references of record discloses exposing an epoxy nitrile resin to infrared radiation to initiate polymerization or crosslinking.

Nevertheless, the Examiner asserts that it would be obvious to 1) substitute Siebert's epoxy nitrile coating for those of Pelligri, and 2) expose Siebert's coating to infrared radiation to initiate polymerization or crosslinking in lieu of Siebert's thermal process. As explained above, there is no motivation or suggestion in the prior art for replacing Pelligri's composition with Siebert's composition. In addition, there is no prior art motivation for substituting Kirk-Othmer's infrared radiation crosslinking for Siebert and Pelligri's thermal crosslinking.

In support of her obviousness rejection, the Examiner selectively excerpts Kirk-Othmer, contending it "teaches that thermally cured polymer systems, including epoxy/polyfunctional amine systems, form thermal energy and cure by infrared radiation with improved efficiency and focus." 10/14/05 Office Action at 4. However, Kirk-Othmer does not suggest *any benefit* to substituting an infrared process for a thermal process:

> Many conventional coatings systems . . . which cure through thermal processes involved with gas-fired oven technologies

> (see Tables 6 and 9) can ***also*** be cured or processed efficiently using ir radiation energies (91).

Kirk-Othmer at 854 (emphasis added). At most, Kirk-Othmer indicates that thermal and infrared processes are of comparable efficiency. However, neither Siebert nor Pelligri indicate that their respective compositions are even capable of being cross-linked or polymerized with infrared radiation. As a result, one of ordinary skill in the art would not be motivated to replace Pelligri's and Siebert's thermal curing with infrared crosslinking or polymerization.

Claim 25 makes beneficial use of infrared techniques by applying the claimed coating at "generally ambient temperatures." As explained previously, the use of infrared radiation allows the process to run at lower temperatures, avoiding the possibility of warping the fuel cell plates. The cited references do not recognize this benefit--or any other--that would suggest the desirability of substituting an infrared polymerization or crosslinking process for a thermal process. "The mere fact that the prior art could be modified in the manner proposed by the Examiner would not have made the modification obvious unless the prior art suggested the desirability of the modification." *Ex parte Dussaud*, 7 USPQ2d 1818, 1820 (Bd. App. & Int'f 1988)); *see also In re Laskowski*, 871 F.2d 115, 117 (Fed. Cir. 1989). Accordingly, claim 25 is not obvious over the references of record.

3. Claims 27 and 28

Claims 27 and 28 depend from claim 28 and respectively recite infrared exposure times of "less than about forty five minutes" and "less than about 30 minutes." The Examiner has not even articulated a basis for rejecting claims 27 and 28. Moreover, none of the references of record disclose suitable infrared radiation exposure times. Nor do they acknowledge that the exposure time has any significance for the process or the resulting product properties. Thus, claims 27 and 28 are not obvious over the references of record.

4. Claim 32

Claim 32 recites applying a coating precursor consisting essentially of epoxy nitrile resin at generally ambient temperatures on a surface of a fuel cell plate and exposing the coating precursor to infrared radiation to initiate polymerization or crosslinking. As mentioned above in Section VII. C(1)(d)(3) with respect to claim 36, the references of record

do not disclose a composition *consisting essentially of* epoxy nitrile resin. On that basis alone, they cannot render claim 32 obvious. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). *See also Litton Systems, Inc. v. Honeywell, Inc.*, 87 F.3d 1559, 1569 (Fed. Cir. 1996).

Moreover, as discussed above with respect to claim 29, Siebert and Pelligri cannot properly be combined to obtain the claimed composition, and Kirk-Othmer cannot properly be combined with Siebert and Pelligri to obtain the claimed infrared process. On this basis as well, claim 32 is non-obvious over the references of record. *Winner International Royalty Corp. v. Wang*, 202 F.3d 1340, 1348 (Fed. Cir. 2000) (citations omitted)); *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1579 (Fed. Cir. 1997).

E. Claims 26 and 33 Are Non-Obvious Over Pelligri In View of Siebert, In Further View of Kirk-Othmer In Further View of Canfield

Claims 26 and 33 depend from claims 25 and 32, respectively, and further recite the use of screen printing to apply the epoxy nitrile resin. As explained above, there is no motivation for combining Pelligri, Siebert and Kirk-Othmer. Canfield mentions screen printing a gasket on a fuel cell plate. Canfield at 4:48-50. However, it does not discuss any particular gasket materials that are suitable for use with a screen printing process. The Examiner contends that it would have been obvious to substitute Siebert's materials for Pelligri's materials and then use Canfield's screen printing process to apply Siebert's materials to a fuel cell plate. However, Siebert's materials are molded, not applied to a surface such as a fuel cell plate surface. Thus, one of ordinary skill in the art would not be motivated to use Canfield's screen printing technique with Siebert's compositions. Accordingly, there is no motivation or suggestion in the prior art for combining Siebert and Canfield.

The Examiner asserts that it would have been obvious to use Canfield's screen printing method "to provide a patterned discontinuous gasket layer having equally improved insulative properties." 10/14/05 Office Action at 5. However, nowhere does Canfield recognize this alleged benefit of screen printing. Nor do any of the other references of record. Thus, the motivation to combine is not supported by any evidence of record, and the

combination of Canfield with Siebert, Pelligri and Kirk-Othmer is improper. *In re Sang-Su Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Conversely, the present application recognizes the "low cost, speed, and accuracy" of screen printing. Application at page 21, lines 1-10. Accordingly, the subject matter of claims 26 and 33 is not obvious over the preferences of record.

VIII. CLAIMS APPENDIX

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

IX. EVIDENCE APPENDIX

An Evidence Appendix is attached as Appendix B. However, there are no exhibits contained therein.

X. RELATED PROCEEDINGS APPENDIX

A Related Proceedings Appendix is attached as Appendix C. However, there are no related proceedings.

XI. CONCLUSION

In view of the foregoing, it is submitted that the final rejections of the pending claims are improper and should not be sustained. Therefore, a reversal of the final rejections of October 14, 2005 is respectfully requested.

Application No.: 10/790,502 Docket No.: 60680-1843

Appellant believes that a fee of $500.00 is due with this Appeal Brief. Please charge our Deposit Account No. 18-0013, under Order No. 60680-1843 from which the undersigned is authorized to draw.

Dated: March 13, 2006

Respectfully submitted,

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APPENDIX A

CLAIMS APPENDIX

Claims Involved in the Appeal of Application Serial No. 10/790,502

25. (Previously Presented) A process for sealing and insulating a fuel cell plate, the process comprising:

providing a gas impermeable fuel cell plate having first and second surfaces;

applying an epoxy nitrile resin at generally ambient temperatures on at least the first surface of the fuel cell plate, the coating precursor adapted to polymerize or to cross-link in response to infrared radiation; and

exposing epoxy nitrile resin on the fuel cell plate to infrared radiation to initiate polymerization or cross-linking.

26. (Previously Presented) The process of claim 25, wherein the epoxy nitrile resin is applied by screen printing.

27. (Previously Presented) The process of claim 25, wherein the epoxy nitrile resin is exposed to infrared radiation for about less than about forty five minutes.

28. (Previously Presented) The process of claim 25, wherein the epoxy nitrile resin is exposed to infrared radiation for about less than about thirty minutes.

29. (Previously Presented) An insulated fuel cell plate comprising:

a gas impermeable plate having first and second surfaces; and

a solid coating polymerized or cross-linked in response to infrared radiation at generally ambient temperatures and adhering to at least one of the first and second surfaces of the plate, the solid coating comprising an epoxy nitrile resin.

30. (Original) The insulted fuel cell plate of claim 29, wherein the solid coating is less than about 250 μ thick.

31. (Original) The insulated fuel cell plate of claim 29, wherein the solid coating is less than about 150 μ thick.

32. (Previously Presented) A process for sealing and insulating a fuel cell plate, the process comprising:

providing a gas impermeable fuel cell plate having first and second surfaces;

applying a coating consisting essentially of epoxy nitrile resin at generally ambient temperatures on at least the first surface of the fuel cell plate, the coating precursor adapted to polymerize or to cross-link in response to infrared radiation; and

exposing the coating precursor on the fuel cell plate to infrared radiation to initiate polymerization or cross-linking.

33. (Previously Presented) The process of claim 32, wherein the epoxy nitrile resin is applied by screen printing.

34. (Previously Presented) The process of claim 32, wherein the epoxy nitrile resin is exposed to infrared radiation for about less than about forty five minutes.

35. (Previously Presented) The process of claim 32, wherein the epoxy nitrile resin is exposed to infrared radiation for about less than about thirty minutes.

36. (Previously Presented) An insulated fuel cell plate comprising:

a gas impermeable plate having first and second surfaces; and

a coating polymerized or cross-linked in response to infrared radiation and adhering to at least one of the first and second surfaces of the plate, the coating consisting essentially of an epoxy nitrile resin.

37. (Previously Presented) The insulted fuel cell plate of claim 36, wherein the coating is less than about 250 μ thick.

38. (Previously Presented) The insulated fuel cell plate of claim 36, wherein the coating is less than about 150 μ thick.

APPENDIX B

EVIDENCE APPENDIX

NONE

Application No.: 10/790,502 Docket No.: 60680-1843

APPENDIX C

RELATED PROCEEDINGS APPENDIX

NONE